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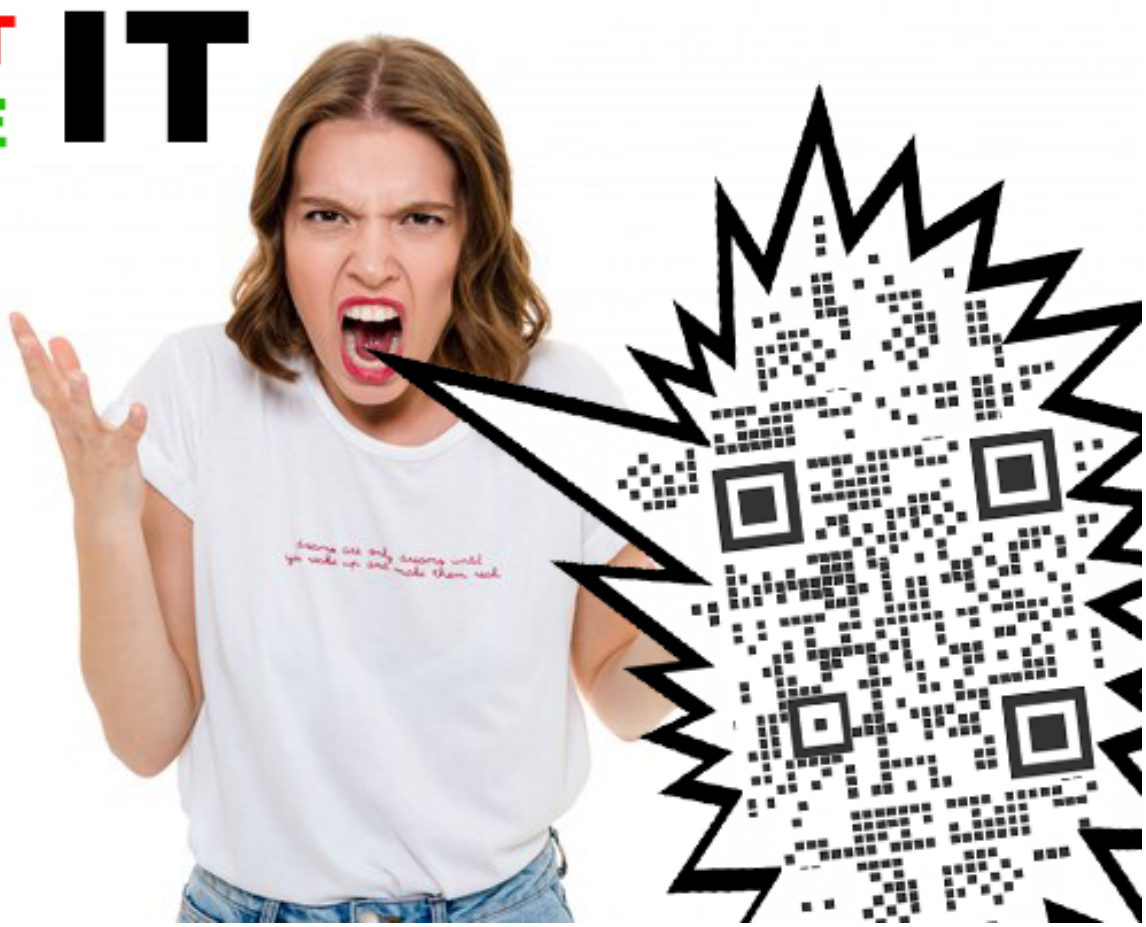

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EVOLUTION

A Journal of Nature, Published Monthly by Evolution Publishing Corporation, 96 Fifth Avenue, New York.

MAN'S BLOOD COUSIN—THE GORILLA

Articles by

David Starr Jordan, William K. Gregory, Henshaw Ward, Albert G. Ingalls, Maynard Shipley, Horace J. Bridges, Barrow Lyons, Harry A. Overstreet

Who Believes in Evolution?

By David Starr Jordan

JUST now in America organic evolution has come to the front as a popular issue. With it is the broader question as to whether scientific teaching and scientific research shall be subject to official censorship of men who know nothing of such matters. As to the final issue there can be no doubt, for science will insist upon and secure its own freedom.

The word evolution as commonly accepted comprises two distinct conceptions, the making of the material universe and the development of life and mind on the earth. Cosmic evolution deals with the formation of worlds, moons, mountains, crystals, seas, rivers and glaciers—matter that in itself has no organic life. This bears no intimate relation to organic evolution, the development on the earth of animals and plants. It is true that all are in the same universe, from which nothing can escape. It is true that all are undergoing change, and that all such change so far as we can trace it is, in all its details, perfectly orderly.

David Starr Jordan

But to unite the phenomena of life and those of inert matter as one group of phenomena is to ignore and confuse our knowledge of the essential qualities of organized life. Cosmic evolution in these days no one presumes to doubt. Its struggle with tradition is virtually past. The facts of organic evolution are equally well, though not so exhaustively, settled, but there persists a kind of guerrilla warfare against its main conclusions.

In their relation to organic evolution, several classes may be recognized among our people. We have first a small minority comprising those who know as to the common origin of animals and plants, either through broad, critical observation of animals and plants—the naturalists—or through experiments with living beings or organisms—the geneticists. Among these there is no difference of opinion on the main question. All life is and has always been subject to orderly divergence. The animals and plants of today are descended from those of the past. All men who have a right to an opinion or are capable of forming an opinion from the evidence of nature are now evolutionists. The main facts are in, and none of them are explainable under any other supposition. The great argument in biology is the cumulative one. But as to the relative value of the factors or forces which brought it about, and as to the probable geological history of each group, there remains much difference of opinion. Such differences furnish incentives to future work.

A second class called evolutionists, often very baffling to workers themselves, are the imperfectly educated who accept evolution but are impatient with the slow progress which actual knowledge demands. They delight to run ahead of science and to anticipate it by methods of fancy, using fragments of philosophy, bits of poetry or of assumed "logical necessity." In science we can know the truth only so fast as we can find it out. Science is embarrassed by tradition and intuition alike.

A third and much larger class realize they must accept most conclusions on the authority of men who have given their lives to the study of the science of life and are therefore in full agreement as to the meaning of what men have found to be true. No man can have an opinion of his own on all subjects. He must trust to authority for the most. But the mark of the educated man is that he knows what authority he can trust. To enable men to do this is a central purpose of education. To teach this conclusion or that, one set of dogmas rather than another, truth even rather than falsehood, is not a university's business. It is rather to give such training as will enable the student to find out for himself. Only by such means can any man acquire the "courage of his convictions." A working hypothesis becomes science only when rival hypotheses have definitely ceased to work. When this takes place science moves on, never returning to occupy territory once abandoned.

A fourth class are interested chiefly in evolution in so far as it seems to stand in opposition to current orthodoxy or to religion.

A fifth class, the largest of all, enjoy going with the crowd, priding themselves on their hundred per cent regularity in all matters of opinion having the backing of some form of tradition. The burden carried by *tradition* is essentially one of ignorance. It treats as final the conceptions of able men of other ages, who had neither tools of observation nor training by which to carry on experiments. These men, of whose judgment we have records, were devoted and sincere but made no claim to any form of omniscience, only reporting their own impressions in forms of history and poetry.

A sixth class rejoice in being blind leaders of the blind, scorning science and willing to use civil authority for its suppression.

(*Dr. Jordan's argument will be continued in the next issue of* Evolution)

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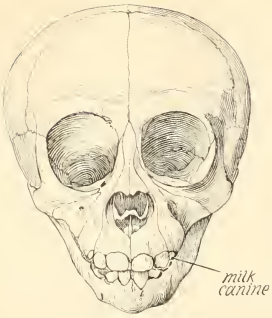


Gorilla Baby

The Testimony of Man's Teeth

By William K. Gregory

THE infant gorilla that is now in the Philadelphia Zoological Park is a friendly little chap, wanting chiefly to be babied and fussed with. So it is not surprising that he let me put my finger in his mouth to feel his teeth. If he lives several years longer he should, if he is like other young gorillas, eventually have a full set of milk teeth numbering twenty in all and arranged as follows:

on either side of the upper jaw
two incisors, one canine, two "milk molars";
on either side of the lower jaw
two incisors, one canine, two "milk molars."

Is it a mere coincidence that normal human children also have twenty milk teeth? And that they also have,

on either side of the upper jaw
two incisors, one canine, two "milk molars";
and on either side of the lower jaw
two incisors, one canine, two "milk molars"?

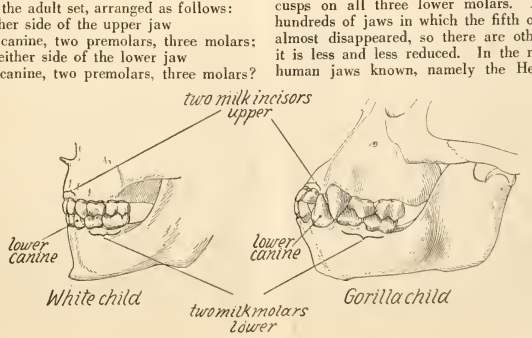
And is it a further coincidence that when gorilla and human children grow up they should as a rule have thirty-two teeth in the adult set, arranged as follows:

on either side of the upper jaw
two incisors, one canine, two premolars, three molars;
and on either side of the lower jaw
two incisors, one canine, two premolars, three molars?

And is it not significant that these particular numbers and arrangements of the milk and adult teeth in all the class of mammals are found only in the higher or Old World monkeys, apes and man? Is man made literally in the image of God in this respect also? Or did he inherit his normal "dental formula" from some far-off members of the ancestral stock of the anthropoid apes, as Darwin inferred?

Let us follow this line further. How many principal points or cusps has the reader got on his second right or left lower molar? If he is like most people he will find only four cusps, separated from each other at their bases by two main grooves forming a cross. This is a distinctly human arrangement and taken by itself is a conspicuous point of difference from the corresponding tooth of all the known apes, living and fossil, which have normally five cusps on the second lower molar.

But about one-fourth of white people have a fifth cusp on the first lower molar and a good many negroes, black Australians and other primitive individuals have five cusps on all three lower molars. And as there are hundreds of jaws in which the fifth or hinder cusp has almost disappeared, so there are other jaws in which it is less and less reduced. In the most ancient fossil human jaws known, namely the Heidelberg jaw, the



Mousterian jaw and the Ehringsdorf jaw, there are five main cusps on all three lower molars.

Is it another coincidence that each of the three lower molars of all the known anthropoid apes also bears five main cusps? And is it also by chance that in all known apes and many men these cusps are separated at their bases by six main grooves, each of which obviously corresponds in position in apes and men? Thus if the reader wears the sign of the cross on his second lower molar, the chances are that his first lower molar is impressed with the mark of the ape, and certain it is that the oldest known fossil human lower molars are the ones that most closely approach the "Dryopithecus pattern" of the primitive ape molar.

We do not yet know the direct ancestors of man as well as we know the direct ancestors of the horse, but what little we do know of fossil men and fossil apes is fully in accord with the vast mass of testimony already gathered by the students of human and comparative anatomy and physiology. Their verdict has long been that man is a blood cousin to the ape. What scientific evidence is there to the contrary?

Bamboo

NO BABY animal in America today is attracting more attention from men of science than fourteen-months-old Bamboo, the infant gorilla in the Philadelphia Zoo. He is the most human animal infant in captivity for his ways are decidedly like those of a normal baby of our own species.

That should not be the least surprising, for he is in fact a blood cousin, very distantly removed, but nevertheless from the same ancestral stock as homo sapiens—modern civilized man. Way, way back some four or five million years ago, there lived an old fellow and his wife whom scientists now call Mr. and Mrs. Dryopithecus. In all probability Dryopithecus was the common ancestor of the modern man-like apes and human beings.

Probably his children crawled and cried much like our own little ones and much like baby Bamboo in the Philadelphia Zoo, for those who have watched him say his movements are astonishingly childlike; and when he is put down he cries to be taken up again in just about the same tones we have all heard voiced by babies in our own homes.

Bamboo

But there are few human babies who have travelled as far as Bamboo. One warm morning last spring Bamboo's mother took her sprawling infant out for an airing in the mountainous Cameroon district of German East Africa. He was then a squat, black, awkward little fellow who clung timorously to his mother's great hands—as he still is. A native scuttling through the jungle nearly bumped into Bamboo's mother and forthwith she dropped her child and started to make life lively for the native. The man drew a poisoned arrow to save his life and sunk it deeply in her chest. He scooped up Bamboo and took him to a missionary camp.

Natives who crated Bamboo for his trip overseas knew enough about baby gorillas to realize that he would not eat unless he had a less sensitive companion, so Lizzie, ten months old, but of a motherly nature, though of Chimpanzee stock, was put in the cage with him to keep him from dying of homesickness and loneliness, and stimulate his appetite.

When Bamboo arrived at Henry Bartel's animal place in New York he proved so charming a host that many of his callers could not be prevailed upon to leave for more than two hours. Newspaper men and photographers soon succeeded in making him one of America's most distinguished guests.

It was then that the young gorilla child became known as little Bimbo—not Bamboo, as the dignified Philadelphia Zoo later decided to re-christen him. His companion, Lizzie, also became well known, but most of the charm seemed to be with the gorilla personality. Professor Robert Mearns Yerkes of Yale University wanted to take Bimbo with him to Yale for observation and study, but Mr. Bartels wanted $5,000 for the privilege. So finally Bimbo—or rather Bamboo — went to the Quaker City.

It has proved very difficult to raise gorilla children in the United States, but thus far Bamboo seems to be doing nicely, thank you.

If Bamboo lives, we can expect him to teach us a great many extremely interesting things that a human child would not teach. Human children have been closely observed for quite some time, but gorilla children have furnished very little laboratory material to psychologists and biologists. Throughout the progress of his childhood he will be closely watched by those most interested in the genealogy of their race—and Bamboo's.

RADIOACTIVITY IN THE HEART

DR. H. Zwaardemaker of the University of Utrecht, a distinguished Dutch physiologist, has discovered that the heart muscle removed from an animal can be kept in motion by rays from radium and other radioactive substances. A common element, potassium, is believed to be slightly radioactive and is known to exist in the blood and in the heart muscles.

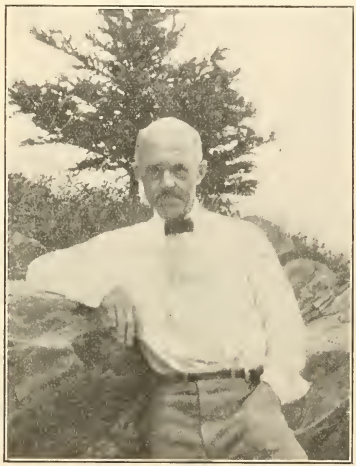
From this Dr. Zwaardemaker deduces that the living heart is kept in motion partly by the radioactivity of potassium in the body.

What Is Evolution?

By Henshaw Ward

IT is astonishing to see how often "evolution" is misconceived by educated people, sometimes even by scientists. Learned journalists and professors have upheld or derided evolution without first inquiring what the theory really is. I will briefly describe how it originated, how inescapable it is, how simple and restricted it is.

Since the time of Aristotle there has been in the world a theory that in some unknown way, animals and plants have developed from previous simpler forms. This idea arose very naturally from the mere observation of the way in which the kinds of animals form a sort of series from lowly plant-like forms to quadrupeds. From the lowest plants to man there is no big gap in the scale of forms: all animate nature appears to be a sort of gradation. No wonder that Aristotle and Lucretius and Leonardo da Vinci guessed that the great array of living beings might have diverged from some primitive creatures.



Henshaw Ward

But this was merely speculation. Not until the eighteenth century was there any real effort by naturalists to explain *how* such transmutation was possible. The most original and powerful of the early reasoners was Buffon, who set forth an ingenious conjecture in 1750—that changes of climate and food cause alterations in animals, and that these alterations are inherited, continually diverging more widely from the parent stock. Buffon argued persuasively from the changes known to be brought about in a series of generations by domestication. Forty years later Erasmus Darwin, grandfather of Charles Darwin, took up Buffon's idea, modified it by his own wide and keen observation, and argued for its probability. In 1809 the great French naturalist, Lamarck, reasoned that the principal cause of the transformation of species was the changes brought about in animals by their strong and repeated efforts to satisfy their desires. In 1844 a Scotchman, Chambers—though he called Lamarck's reasoning foolish—upheld Lamarck's conclusion in an ingenious little book called *Vestiges of Creation*.

These four imaginative men—no others were important in comparison—kept alive a development theory and had a few followers, but the total effect of their reasoning on scientific thought was almost nil. Huxley has vividly described how disreputable the theory was in the fifties, and Weismann testifies that he could not even learn about it in respectable books during his student days of that period.

Darwin, after five years of zealous observation in a voyage round the world, set himself to study the species question in 1837. For twenty years he amassed evidence, letting only two friends know what he was about, and receiving little encouragement even from them. His *Origin of Species* in 1859 set forth, as Huxley unequivocally states, an idea "that was wholly unknown to scientific thought before 1858."

All previous thought had assumed that environment somehow produces changes in animals. Darwin saw that the truth was the other way round—that *changes originate in the embryo of every plant and animal*, by a process quite unknown to us; that these spontaneous variations can be inherited; that if they are harmful they will not survive in heredity; that if they are advantageous they will be perpetuated, will tend to increase, and will finally cause a race to differ so much from its ancestors that it will be called a new species.

Darwin, by a sort of parable, likened the forces of nature to a breeder, who selects variations. He said that nature acts as if it "selected" unfavorable variations and discarded them, while keeping the favorable ones to form new races.

This idea was a mere hypothesis when Darwin published it. He did not claim that he had proved anything; he simply showed from his wealth of knowledge the strong probability that his idea was true, and he asked what facts could be found that were opposed to it or what other theory could be suggested that would fit the great variety of known facts. Darwin's theory was not accepted because it was clever reasoning about one department of science, but because it neatly fitted all the widely separated departments. It explained the geologic record, the mazes of classification, the life of an embryo, the puzzles of distribution, the marvels of adaptation. It has ever since become increasingly obvious that a theory which accounts for *all* these unrelated fields and bring them into a scientific harmony must be true—unless the universe is a whirlpool of unreason.

Some modern students of heredity minimize Darwin's "natural selection" and feel that they are going to discover a rather different way of explaining evolution. They are so much concerned, in their special work, with the *mode* of evolution that they give the public the impression they are attacking an evolution theory. For one example: Bateson spoke out so radically in

1914 against natural selection that Bryan understood him to be opposing evolution. Yet nothing was further from Bateson's thought. During the rest of his life he declared vehemently that the evolution theory was inescapably true and that he had referred only to a mode of explaining the process. The Batesonians are now a small minority. No rival theory to Darwinism has yet been proposed, much less accepted.

The evolution theory, whatever may be finally approved as the process of it, accounts for all the present forms of plants and animals as developments from earlier forms. It is nowadays as fundamental to all study of organic life as gravitation is to astronomy. A biologist can no more conceive that it will be disproved than an astronomer can imagine that the earth will one day be proved to be flat.

But evolution is a very limited theory. It is purely biological. No astronomer can reason from it to the history of nebulas; no sociologist can argue from it to any law of social development. No philosopher can prove from it anything about metaphysics or theology. The evolution theory is like all advance in knowledge: it shows the operation of invariable natural law, and thus frees us from superstitious fears. To oppose it is to oppose the whole enterprise of liberating the human mind.

John Daniel, 2nd

By Albert G. Ingalls

THE Philadelphia Zoo has a new gorilla, a little chap only about a year old. At present, says the *Bulletin of the Zoological Society of Philadelphia*, it is the only living specimen in any American Zoo, the well known youth, John Daniel 2nd, having succumbed to illness despite the remarkably expert and sympathetic care of his owner, Miss Alyse Cunningham.

The writer recalls an interesting and lively hour spent with John Daniel 2nd when he was about three years old. He was every inch a monkey and set out from the start to prove it. Even a "kid" gorilla—80 pounds—is a capable roughhousing partner and John, with 100 pounds disadvantage in weight, was certainly capable enough.

Had I been able to muzzle his teeth, with which he insisted on playfully, but much too enthusiastically, nipping my neck and legs, I felt I might have coped with him, as long as he kept his temper—which he did, though I tried no experiments to find the disposition border line!—for his shoulders, torso and hands were just the size of mine.

John pretty nearly wore me out, and he enjoyed it to just about the same extent that a college boy enjoys roughhousing with his "roomy." Likewise, he acted about the same, continually chuckling as he breathed.

A number of people, accustomed, I suppose, to seeing grind-organ monkeys giving continual attention to parasitic pursuits, have shuddered when told that I scuffled with this "filthy" gorilla. Well—the gorilla was about like a well-washed pet dog, and a darn sight cleaner than some humans. Isn't this belief that all anthropoids are dirty why some people who accept evolution as a principle refuse to accept it as applied to man? Or have I got the cart before the horse?

Predicting by Evolution

By Maynard Shipley

ALTHOUGH we still speak of the "theory" of evolution, or the "doctrine" of evolution, the gradual development of higher forms of plants and animals from lowly ancestors is now regarded as an established fact.

Stating the view of the vast majority of living scientists, Professor Henry Fairfield Osborn, President of the American Museum of Natural History, declares that evolution has "long since ceased to be a theory; it is a law of Nature as universal in living things as is the law of gravitation in material things."

It might be objected that by the law of gravitation the astronomer accurately predicts the position of a planet "but who can tell which way a cat will jump?"

No doubt we could predict the direction of a cat's response to internal and external stimuli, if we possessed the necessary data and knew how to interpret the factors involved. The cat jumps under "law"—determinism—as surely as the moon causes a particular kind of eclipse of the sun at a predictable time. Just so, numerous accurate predictions of the existence of then unknown facts or even anatomical structures have been made on the theory of evolution.

For example, it was predicted that more careful study would reveal in the human wrist a central bone. If the theory of evolution, which assumes that the species living at any time are the result of the modification of pre-existing species, is valid—that is, if evolution is a fact—at least a vestige of such a bone should be inherited by man from his pre-human ancestors. It was subsequently found to be present in the wrist of the human foetus.

Again, the presence of an extra pair of rudimentary ribs was predicted and later found in the unborn infant—making thirteen pairs, as in the adult gibbon and gorilla. Occasionally a thirteenth pair of ribs appears in the adult neck, just below the thorax, a reversion to a primitive type. In the same way, a fourth molar tooth sometimes appears, the usual number in some of the lower mammals. But while such reversions to ancestral structures might reasonably be expected, they are only occasional, not predictable in a given case.

A notable example of prediction on theory is that made by the German poet-scientist Goethe. In mammals below man there are two little bones in the center of the upper jaw, below the nose. These hold the four upper cutting teeth. In man they had not been known to exist. Goethe, as an evolutionist, insisted that this "mid-jawbone" should be present, a heritage from man's pre-human ancestor. The Fundamentalist anatomists of the period cited their apparent absence as showing that man and the higher apes, gorilla, gibbon, orang, chimpanzee, were not genetically related.

The presence of such bones was emphatically denied by the special-creationist anatomist Peter Camper—at that time the highest authority on comparative anatomy. The great poet-philosopher determined to find the predicated bone. At last he did find it. It is seldom recognizable except in the skulls of youths, since it usually coalesces at an early age with the adjoining upper jawbone; but it is always discernible in the human foetus, as recapitulating in accordance with the biogenetic law, a stage in the earlier evolution of man.

So we may safely say, with Professor Maynard M. Metcalf, that it "can be only the uninformed who fail to accept evolution as a fact established beyond doubt."

Ethics Coming of Age

An Informal Interview with Harry Allen Overstreet, Professor of Philosophy, College of the City of New York
By Barrow Lyons

MEN and women—particularly young men and women—more and more are losing the ancient attitude toward sin. Perhaps it is a good thing. Let's talk about it.

Old ethical systems which attached a great deal of importance to the consequences of sin are today up for appraisal. In a large measure they are the outgrowth of experience under very limited conditions combined with some delightfully naive ideas of what the world is made of.

These rule of thumb ethical systems of the ancient days to some extent met the situations they were intended to meet, but in a great many ways they failed, just as medicine often failed because we did not have science enough to know how to use it.

A significant thing about ethical judgments is that they do not have the immediate testing that judgments in the material world have. One makes a bad tool and soon finds out that it will not work; but it may take several centuries to find out how bad an ethical rule is. In ethical life there is bound to be a hangover from the older generation of ethical rules never fully tested out. This is true in all our ethical relationships—in politics, sex judgments, business judgments and religious attitudes.

Loaded with Emotion

Ethical judgments always are loaded with a certain emotional content. When the tribe believes a certain action is righteous it develops a strong emotional attitude toward that act, and any deviation from the code is regarded with the greatest indignation. Ethical judgments have usually been couched in absolutes. They are not like automobiles—the style of which changes from year to year. In the realm of mechanical things we are quite willing to discard old-fashioned tools. We are not at all willing to discard old-fashioned tools in ethical life—but we should be, when better tools come to hand.

Another difficulty in ethical thinking is that the rules usually are inculcated in childhood. Children are not old enough to make independent judgments, so they are told what to do. They are instructed to eat in certain ways; they are threatened with punishments and warned of sins. Children grow up with ethical assumptions that are supposed to be accepted without question. But it is nothing less than a crime against children to impress them with dogmas at a time when they are helpless to protect their minds.

Ethics a Practical Matter

The question is, how can we modify that attitude? How can we bring a scientific attitude of mind to bear upon morality. Perhaps the first great change in thinking will be in ceasing, as most of our present generation do, to regard ethical judgments as somehow handed down from on high. In this respect, the newer generation, however, is freer than the old. It is progressing beyond the authoritative conception of ethics toward a rational conception. It is taking long strides from the ethics of the immutable Ten Commandments to the ethics of scientific insight.

As a matter of fact, all purely authoritative views today are gradually disappearing, except among superstitious and ignorant people. Just as physical science is teaching us to take care of our stomachs, so ethical science is teaching us to keep our group life healthy.

Just what is good or bad for society, of course, is a matter for interpretation. Perhaps it can be translated into terms of pleasure and pain—happiness and unhappiness—satisfaction and frustration. Or perhaps there are other criteria. But we should see clearly that there is nothing absolute in ethical judgment—that it has evolved as truly as the body has evolved. Hobhouse in his *Morals in Evolution* has made this very plain.

Making the Passage Now

This present generation is actually making the passage beyond the authoritative form to the scientific form of ethics. My own children have been brought up to understand that telling lies is not the sort of thing that makes for the best kind of life in the kind of society in which they wish to live.

That attitude, I think, is the greatest step that has been taken in social evolution. The same attitude is developing in regard to the ethics of sex. Nowadays the lid is off and we are trying to find out what is best. We are trying to find out what sex relationships are fine and what ugly, what make for human happiness and what for misery. Sex today is the great open question. Judge Lindsay's suggestion of companionate marriage illustrates what is happening in the revaluation of sex relationships.

Then there is a whole new system of ethics to be worked out yet, which pertains to the new environment in which we live. When Moses, if he ever lived, led the children of Israel to the Promised Land, there were no labor troubles of our type, no Wall Street, no possibility of organized finance with its great power over the lives of all people, no complex international relationships, no diplomacy, no treaties. Therefore the ethics accepted by those following traditional religion has nothing to say about these relationships.

Question to Fundamentalists

What does stealing mean in business? What should be the ethics of profit-taking, charging interest, making extravagant claims for our goods, deceitful diplomacy for the sake of country? What is the correct ethics for a stronger nation dominating a smaller nation for the sake of carrying on our so-called civilization?

Fundamentalists have nothing at all to offer here; and when they say the Bible is all-sufficient, they simply fail to recognize these great relationships which have come into the world since the Bible was put together.

Women, too, complicate the ethical situation. In the past the world has regarded women as property. Women today are recognized as human beings. Doesn't it seem as though our sex ethics must be rethought in the light of the claims women now make for themselves? What have the Fundamentalists to say about that?

The situation would be ridiculous if it were not, at times, so tragic.

EVOLUTION

A Journal of Nature

To combat bigotry and superstition and develop the open mind by popularizing natural science

Published monthly by
EVOLUTION PUBLISHING CORPORATION
96 Fifth Ave., New York, N. Y.
L. E. KATTERFELD,
Managing Editor

Subscription rate: One dollar per year
In lists of five or more (*in U. S. A., outside New York City*), fifty cents
Single copy, 10 cents
20 or more at 5 cents each

Application as second class mail pending at Post Office in New York, N. Y.

NUMBER 1 DECEMBER, 1927

OUR NAME

EVOLUTION has been selected as the name of this magazine because the evolutionary concept of man's development is the idea upon which fundamentalists have seized to build an issue. It symbolizes the entire conflict between those who see life through the eyes of science and those who look upon it chiefly through the misty superstitions of the past.

The fundamentalists have a strategic advantage in their nearness to the public ear. Men of science are separated from the masses by their vocabulary, dislike of publicity and absorption in work.

This magazine will help bridge that gap by furnishing a forum in which science itself can speak in popular language without fear of the restraints with which fundamentalists are seeking to shackle them.

OUR POLICY

THE preliminary announcement of EVOLUTION stated that:

"EVOLUTION will be non-political, so that all upholders of academic freedom can support and use it no matter how they differ on other issues. It will be non-religious, never making any effort to reconcile science with religion. Nor will it make atheism its mission. It will carry the positive message of facts from every field of natural science and leave it to the reader to make his own mental readjustment."

The favorable reception accorded to this announcement convinces us that this policy will develop a large field of usefulness for EVOLUTION. With full realization of the difficulties involved, EVOLUTION will endeavor to hew to this line.

FROM MULES?

IT is pretty certain that two people, evolutionist and anti-evolutionist, will outrageously misrepresent themselves when they get into an argument about evolution. Each moves to the extreme opposite position and sticks there like a bull dog to a root. Not a jot of impression, for all the arguments leveled at him, will either reveal. Yet, when the tumult and the shouting have died away each has picked up something to think about, though admit it to the other he certainly never will.

That's the only good of the superheated argument. The surprising thing is the hope that springs eternal that the one disputant will get the other overtly to give in. That should not be expected—it isn't human nature.

Man must be descended from mules, not monkeys. A. G. I.

THOSE IGNORANT AMERICANS

ENGLAND has made a discovery. She harbors, right in her midst, a number of souls who do not believe in evolution! We had supposed, after reading innumerable rather smug, self-satisfied criticisms of America's ignorant backward population, that every Englishman from William the Conqueror to George the Fifth, and from Land's End to John O' Groats was an authority on organic evolution.

The day after Sir Arthur Keith, famous anatomist-evolutionist, presented his presidential address on Darwin's theory of evolution before the British Association for the Advancement of Science, the British backfires began. The address got into the papers where the plain people—not, of course, ignorant and backward like ours—got hold of it. The old controversy, supposed to be dead in England since the eighties, awoke to life again.

Said Sir Arthur Keith with surprise: "It is clear that Daytonism is alive and vigorous in England. There are still, I am surprised to learn, many men and women who are convinced there is only one reliable account of man's origin—that given in the Book of Genesis."

The trouble has been, all along, that the educated Englishman, accustomed more or less to ignoring the opinions of the common people of his country, has insisted on comparing the beliefs of England's intelligentsia with those of America's masses. A. G. I.

FUNDAMENTALISTS ANNOUNCE NEW CAMPAIGN

THE Associated Press reports that Dr. W. H. Riley, President of the World's Christian Fundamentals Association has just announced in Oklahoma City the launching of a new attack against teaching evolution in Kansas, Oklahoma and Arkansas. In Kansas and Oklahoma the fight will be in the legislatures, while in Arkansas they will appeal direct to the voters through referendum.

Dr. Riley has promised to write an article for EVOLUTION stating the fundamentalist plans. We hope to receive it in time for our next issue.

CONTRIBUTORS TO THIS ISSUE

HORACE J. BRIDGES: leader of the Chicago Society for Ethical Culture; author of *The God of Fundamentalism and Other Studies* and numerous other works on ethics.

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MAYNARD SHIPLEY: President of the Science League of America and author of *The War on Modern Science.*

HENSHAW WARD: author of *Evolution for John Doe. The Circus of the Intellect* and *Exploring the Universe.*

SCIENCE WILL BE FREE

By Horace J. Bridges

"INFIDELITY," said Thomas Paine, "does not consist in believing, or in disbelieving; it consists in professing to believe what one does not believe."

This real sort of infidelity is instantly betrayed by those who seek to suppress, by legal prohibitions and penalties, the doctrines to which they are opposed. Professing their own faith, they betray their unfaith—their secret lack of real confidence in their doctrines—by the very means they adopt to safeguard them. For when a man is really sure, he is serene; he knows that truth, as Milton said, can never be put to the worse in a fair encounter; he is eager for the justification that must come to a true belief after the utmost skill and energy of its opponents have been exerted to demolish it.

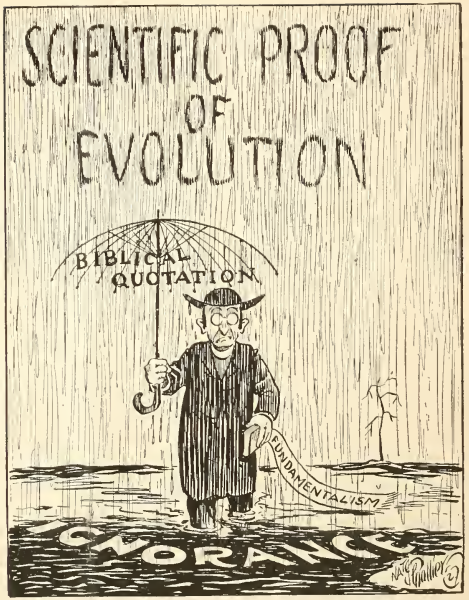
The campaign against evolution offers an immense premium to hypocrisy and insincerity. If a teacher believes in evolution, but is willing to enact the lie of silence, and pretend that he does not, and to teach what he does not believe, then, in States that pass anti-evolution laws, his job and his pay are safe, and promotion awaits him. But if he is determined to be honest and truthful, he is penalized and cast out.

Can anybody believe that the Fundamentalists would have resorted to this policy of the Inquisition, this revival of Dominican methods, if they had seen the slightest chance of the masters of science ever abandoning evolution? Can anybody believe they would have sought to buttress their dogmas by penal laws if they were really convinced that those dogmas could be effectively defended by appeal to facts and reasoned arguments? Who ever heard of laws being invoked in the interest of mathematics, or physical science, or philosophy?

Let the issue be joined then. "We are in earnest—we will not equivocate—we will not excuse—we will not retreat a single inch—and we will be heard."

Whatsoever science discovers, the schools shall be free to teach. Theories shall be called theories, and hypotheses hypotheses. The facts that suggest them shall be exactly set forth, and our young men and women invited to let their minds play freely upon them. And established laws—that is, theories found to accord with all the known facts, and accepted by the consensus of the competent—shall be taught as laws, no matter what traditional doctrines they traverse or displace.

Evolution is one of these laws; and we stand for it, and shall fight for it, because loyalty to truth demands this, and no other loyalty can be permitted to come into conflict with that supreme one.



New Umbrella, Mister?

ENVIRONMENT'S THE THING

FOSSILS many millions of years more ancient than the oldest fossils previously known have recently been found in eastern Finland and sent to the British Museum. They are fossil algae, a primitive form of life which may still be found in one form or another all over the world.

This calls to mind the question often sprung by the anti-evolutionist, "If all the animals are supposed to have evolved from primitive forms like this, how does it happen that there are any of these primitive forms left?"—a perfectly logical question. Logic often leads astray, however. All the higher organisms did evolve from such ancestors, but not all the ancestors evolved into higher organisms. Some of the forms were thrust into environments that put them to it for a living. Under adversity—not too great—they evolved. Others met litle adversity and stayed "as was" all down through the geologic eras.

The same "logic" is often applied by the antis to monkeys: "How is it all these ancestral monkeys of the early Tertiary Period didn't become human beings, so that there would be no monkeys left today?" A little homily will illustrate: If you take a monkey, surround him with conditions under which he has to scratch pretty hard for a living, you make a man of him. Take a man, give him everything he wants, deprive him of the incentive to work, and you make a monkey of him. A. G. I.

A Battle Cry to True Fundamentalists

By the REV. PORPHYRY LUMMOX

Brother Fundamentalists:

It is with deep regret that it becomes my duty to review a year of effort marked by sad reverses and but few advances for the Fundamentalist cause. We might as well be honest with ourselves and face the facts. Though science deny him, Satan still is gaining ground and unless those who feel deeply the danger for those who are dear to them mobilize, a condition eventually will come about in which a Fundamentalist will be as out of place in this world as an Angel of the Lord would be in Hell.

Bills which our supporters have introduced in the Legislatures of West Virginia, Missouri, Connecticut, Arkansas and Oklahoma all have been voted down, some of them by a very slight margin, it is true, but nevertheless a sufficient margin to permit the continuation of the teaching of subversive evolutionary propaganda designed to pervert the youth of America for the Devil's own purposes. When one views the defeat of one measure after another prepared to protect our youth from blasphemy, who can doubt the existence of a Spirit of Evil—a real Satan—as real as he who once pointed out the pleasures of the world from the mountain.

Florida a Bright Spot

There was just one State in which right triumphed in the Legislature. In Florida the House passed a bill by a majority of 67 to 24 making it unlawful to teach in the public schools of the State "any theory that denies the existence of God or divine creation of man." Here is clearly the hand of God working through his chosen agents, the legislators. It is pitiful they do not also appropriate more money for the improvement of the schools, but perhaps we should not expect improvement in too many ways at once. It is a crying shame, too, that more is not done to protect the health of people within the State. Where there are so many ardent Fundamentalists we cannot afford to have their ranks thinned by disease which might be prevented.

The tocsin was again sounded by our great Dr. W. B. Riley, President of the World Christian Fundamentals Association, when that most important of our American institutions met last May at Atlanta.

Asleep too Long

"It is time for Fundamentalists to act. We have been asleep too long," Dr. Riley declared. I regret only his phraseology, for being asleep too long is just what our opponents, the Modernists, charge us with. Lack of success in our efforts, Dr. Riley pointed out, has resulted chiefly through lack of preparation. Sufficient of the customary pressure was not brought to bear upon the legislators by our associates in practical affairs.

As Dr. Riley pointed out, it is the idea of trying to civilize the world rather than to evangelize it which has cost us so dear. It is this false idea of the real objective of religion, this modernizing idea, which caused the fall of the interchurch movement and which brought into disrepute the Federal Council of Churches.

Nefarious Professors

I regret exceedingly to say that our foes are beginning to organize. It was at the American Association of University Professors' meeting last winter in Philadelphia that steps were taken by that society to bring our opponents together. This organization is composed almost entirely of rabid evolutionists—men who are virtually sworn to uphold the nefarious Darwinian doctrines. They are, perhaps, the most serious menace the nation now faces.

The avowed purpose of this group is to take the initiative in organizing all groups interested in defeating the bills which we propose in the various State Legislatures. These professors undoubtedly are subsidized by the liquor interests.

One Scoundrel Less

There are a few encouraging signs, however, which point to opportunities for Fundamentalists. With Governor Richards of South Carolina on the board of trustees, Winthrop College has removed from its faculty a snake in the grass—Professor William Garner Burgin, who insisted upon teaching evolution to his classes. What diabolical influence men like this are able to exercise was clearly shown when more than eighty students repudiated charges of improper conduct against Dr. Burgin and virtually flouted the college authorities. There could be no more striking example of the manner in which the evolutionary doctrine is undermining the morals of our boys and girls.

There is also hope in the establishment of a Fundamentalist college in Des Moines. With ringing words Dr. E. O. Kaserman, head of the biology department, denounced modernist science as narrow and intolerant at the ceremonies attending the taking over of the school by the Baptist Bible Union. It is encouraging to note that over twenty members of last year's faculty have resigned since the Union has assumed control of the college. It seems that these so-called teachers remarked in an attempt at humor that they couldn't swallow the story of the whale swallowing Jonah.

You must realize, however, that to carry on our effort requires money. I hate to mention the subject, but it is one of the hard facts of life, just like the existence of Satan, that we must face. Nevertheless, it is comforting to realize that while the evolutionists may be rich in ideas, they are far poorer than we in the necessary dollars, which are still powerful weapons in the cause of richeousness.

THE ENGLISH ROW

QUOTH the Rev. Dr. E. W. Barnes, Bishop of Birmingham, before the youth of Westminster School:

"Darwin's triumph has destroyed the whole theological scheme. Man is not a being who has fallen from an ideal state of perfect innocence; he is an animal slowly gaining spiritual understanding. It is quite impossible to harmonize this conclusion of scientific inquiry with the traditional theology of any branch of the Christian Church. If, then, opinions widely and even universally held turn out to be wrong let us declare the fact, and we need not blush as we make our confession."

That started the row. The Church of England awoke to find itself split into two camps. Said Dean Inge of St. Paul's Cathedral:

"The doctrine of evolution has long been accepted in the broad outlines by all educated people, the clergy included. The tendency of religious persecution has clung to Christianity like a shadow ever since the two apostles incurred the rebuke of their Master by wishing Him to call down fire from Heaven upon a village which would not receive them."

Wrote Bishop Barnes to the Most Rev. Randall T. Davidson, Archbishop of Canterbury and Primate of All England:

"No man shall drive me to Tennessee or to Rome."

Whereat the Primate of All England replied:

"You may dismiss the fear that any one in England will drive you either to Rome or to Tennessee. I believe you overrate the adherence of thoughtful people to creation theories of fifty to 100 years ago."

But the fight is not over. There are those who still cling to the idea of creation in a week, Adam and Eve in the Garden of Eden and all of the ancient oriental mythology. They are very serious, earnest and sometimes forceful people.

FUNNYMENTALS

"NO INFIDEL, Atheist or Agnostic shall be employed in any capacity in the University of Texas. . . . No person who does not believe in God as the Supreme Being and the Ruler of the Universe shall hereafter be employed."

—Rule adopted by the Regents of the University of Texas.

"Any thoughtful man should be against this awful theory of evolution. It should be legislated, routed, run and kicked out of existence back to its place of origin which is in hell, because its teachings are against the word of God."

—From a letter written to "The Knoxville News."

"I accept and believe the Bible account of Creation as the direct act of God; the Bible record of miracles; the immediate and infallible inspiration of the Holy Scriptures as the very word of God. . . . As a teacher I will, without compromise, steadfastly stand for these fundamental things, and actively resist every encroachment upon them within my sphere of service."

—From the Bethel College Credal Statement, quoted from The Cumberland Presbytarian Bulletin, McKenzie, Tenn.

"If a minister believes and teaches evolution, he is a stinking skunk and a liar."

—Billy Sunday.

"We are not going to stop until we have driven every Modernist out of our pulpits and seminaries and editorial chairs. We are going to put them out *if it takes our lives to do it.*"

—The Rev. Charles Hillman Fountain, Plainfield, N. J.

"If the evolutionists are getting ready to produce proof that our forefathers—way, way back—really were monkeys—let's get together and Ku Klux them before their proof gets before the public—let's quit chattering about it and act—let's stop them from monkeying with such subjects."

—Editorial from "The New Menace."

"So far as I am concerned, so help me God, I will not be a party to wink at, support, or even remain silent when any group, clique, crowd or machine undertakes to ram down the throats of Southern Baptists that hell-born, Bible-destroying, deity-of-Christ denying, German rationalism known as evolution."

—The Rev. J. Frank Norris in the San Antonio "News."

JUST TWO WEEKS OLD. ASK YOUR FUNDAMENTALIST FRIEND HOW HE EXPLAINS THIS

ON ENEMY TERRITORY

WARFARE will be carried into the enemy territory when the subject of evolution is discussed at the next annual meeting of the American Association for the Advancement of Science assembling in fundamentalist Tennessee. At the Nashville convention, which will be held during Christmas week, a number of noted scientists are expected to discuss the subject.

The association is particularly well adapted to bring the problems raised by anti-evolutionary propaganda before the attention of the public because of its large membership, amounting to approximately 17,000 people in all parts of the United States and abroad. Through its meetings and publications, it keeps this group in touch with current happenings in the world of science and promotes cooperation and good fellowship among scientists. Through its meetings large numbers of scientists are brought into friendly contact and given an opportunity to understand one another's points of view.

The weekly journal, *Science*, which is the official organ of the association, furnishes an open forum for the discussion of questions relating to science and education. It is sent free to all members in good standing. Members also receive reports of meetings.

Expenses of the organization are met by the $5 entrance fee and the yearly dues of annual members at $5 each. All who are interested in the work and aims may obtain further information by addressing Dr. Burton E. Livingston, Permanent Secretary, Smithsonian Institution Building, Washington, D. C.

CO-OPERATE BY CLIPPING

Readers are invited to send clippings of news and articles that they consider interesting, being sure to give date and name of publication from which taken.

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The EVOLUTION PUBLISHING CORPORATION, organized under New York State laws, offers its $10.00 shares of 6% preferred stock. With every five shares of preferred one $10.00 share of common, voting stock will be given.

The immediate business is publishing this journal, EVOLUTION and selling books. Later a Lyceum Bureau for touring natural science lecturers will be developed.

Although it is expected the business will pay, share-holders are not invited on the basis of making profits, but because this work is WORTH DOING.

Additional capital furnished now will help make the circulation campaign for EVOLUTION magazine a success. Checks should be made payable to EVOLUTION PUBLISHING CORPORATION. In remitting kindly state whether payment is made in full, or whether it should be applied on a larger block of stock to be held until the balance is paid.

LET US MAIL SAMPLES TO YOUR FRIENDS

Of course you'll show this issue of EVOLUTION to your friends and ask them to subscribe. But you probably know some who would be interested, whom you can not visit yourself. Send us their names and addresses and we'll mail them sample copies.

It will cost us about five cents a copy to send out these samples, so if you can send along a check to help pay for them we'll not object. However, if your bank account is minus don't let that stop you. Send us the names anyway and we'll raise the cash otherwise.

WHAT'S A HUNTER WITHOUT AMMUNITION?

A hunter without ammunition is in the same fix as an evolutionist without copies of EVOLUTION. Surely YOU don't want to remain in such a pickle. The best way out is for you to fill in appropriate characters on the following blank in a hurry.

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Science Notes

A CYCLOPIAN HUMAN RACE?

SOME of our remote ancestors, the paleozoic lizards, living probably under water, had a third eye on top of the head. When this third eye lost its biological usefulness, it gradually degenerated and finally disappeared. The pineal gland, deeply embedded in the human brain, is thought to be a vestige.

"Will evolution stop with the present two-eyed scheme, or will human beings develop into a one-eyed, cyclopean race?" we now are asked by Dr. Thomas Hall Shastid, opthalmologist of St. Luke's Hospital, Duluth, Minn. He reports that from 95 to 100 per cent. of the detail of any object comes to the brain through the right eye, if the person is right-handed; while if he is left-handed the left eye as a rule takes up the major portion of the detail. This means that the human brain does most of the seeing through one eye, even when both eyes are open.

In an article in the November *Scientific American*, Dr. Shastid deduces from this that man's right eye eventually will become his only eye, and that even now his stereoscopic vision is being destroyed.

"The great cyclopean eye, however, will regain stereoscopic vision by developing two *maculae*—the most sensitive spots—in the one eye, just in the fashion in which many birds have stereoscopic vision in each eye now," says Dr. Shastid. It will probably be able to perceive as light many forms of energy which now produce in human eyes no sort or kind of perception."

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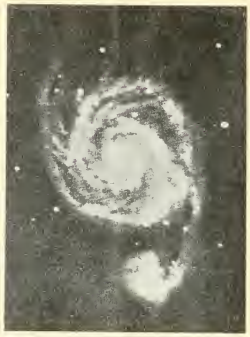

A SPIRAL NEBULA; THE QUESTION MARK IN THE SKY

OURS NOT THE ONLY UNIVERSE

DR. ALLAN DOUGLAS MAXWELL and associate astronomers of the Lick Observatory on Mount Hamilton, California, have taken new measurements of the Milky Way. Using a new type of spectroscope, fitted on the Crossley reflector of the observatory, they measured about 2,000 of the faintest stars, sixteen thousand times too faint to be seen by the naked eye.

According to their calculations the diameter of our universe is about 350 quadrillion miles, or about 60,000 light years. A light year is the distance traveled by light in one year's time going at a speed of 186,000 miles a second.

The farthest stars that they measured are about 100 quadrillion miles from our earth. This means that the light entering the telescope left the star about 15,000 years ago.

It is now supposed that the nebulae, once believed to be incandescent gases lying far beyond our universe, may be other universes, in reality clouds of suns so far away that the separate stars cannot be distinguished. In recent years many thousands of these have been photographed and catalogued. It is estimated that a very powerful reflector, like that at Mount Wilson, is capable of photographing several million of them.

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I'll stake you to a dollar's worth of EVOLUTION, twenty copies, if you'll write me right away for I know they'll sell like hot cakes at your first meeting Address: Katterfeld, c/o EVOLUTION.

WHAT IS THE SCIENCE LEAGUE OF AMERICA?

THE Science League of America was formed in 1924 to combat the efforts of Fundamentalists to abolish the teaching of modern evolutionary science in tax-supported schools and colleges of this country. It was incorporated in 1925, and maintains national offices in San Francisco. It has branches in several cities, and members in 47 states and the District of Columbia, Canada, Mexico, Hawaii, Alaska, the Philippines, Cuba, Porto Rico, Brazil, England and France; and in the faculties of practically all important colleges and universities in the United States. Membership is not, however, confined to scientists, but is open to any man or woman who believes in protection of freedom in science teaching and in complete separation of church and state. The League is non-sectarian and non-political, including both Modernists and Rationalists, and approaching the question at issue from a scientific point of view.

In every state threatened with an anti-evolution law the Science League furnishes the committee of the legislature with a protest brief in the name of its members in that state, and arranges for a representative to speak in its behalf against the bill. The state newspapers are also supplied with information and arguments for use in opposing the proposed action. Besides this, over a thousand newspapers and magazines are kept regularly in touch with news of the war against evolution, and from time to time magazine articles are written by the president giving the history and present status of the anti-evolution agitation.

Protest also is made wherever possible against anti-evolution action on the part of boards of education and similar bodies; publicity is given to cases of dismissal for the teaching of evolution; and occasional educational lectures on evolution and public meetings are held. The League's funds are derived from membership dues—$3 a year, life membership $25. Plans include an extension of the work outlined above, establishment of more branches in state capitals for local autonomous action, and possible test cases in states where the fundamentalist drive has been successful.

A leaflet more fully descriptive of the work and aims of the Science League will be sent on application to 509 Gillette Building, San Francisco, California. All readers of EVOLUTION who are in sympathy with the purposes of the League are cordially invited to co-operate with it as active members.

THE WAR ON MODERN SCIENCE. By *Maynard Shipley*. Published by Alfred Knopf: $3.00.

ONLY an ostrich with his head in the sand could deny, after reading Maynard Shipley's "Short History of Fundamentalist Attacks on Evolution and Modernism" that these constitute a veritable WAR ON MODERN SCIENCE. The evidence compiled in this volume of over 400 pages is overwhelming.

By way of introduction Mr. Shipley gives an adequate analysis of the philosophy upon which the conflict is based and explains the aims and purposes of the fundamentalists as opposed to the methods of science. He then traces the far-flung battle line between the army of reaction and modern science State by State.

In his final chapter on What Is To Be Done he disposes of the pacifist who believes he solves the problem by just letting fundamentalism "go to seed" and sends out a clarion call to action. "Meet organization with organization" is his program. "Build the Science League of America."

Every statement made by the author in this book is buttressed by citations from authorities. In fact it is a veritable arsenal of ammunition for the Evolutionist in the front trenches of the battle line.

L. E. K.

EVOLUTION FOR JOHN DOE. By *Henshaw Ward. Bobbs-Merrill Co.*, $3.50.

LIKE the rest of us amateurs at science, Henshaw Ward has sought the "plain account of evolution—not something written down to the level of a moron, not a nature-loving rhapsody, but an actual description for intelligent people." He did not find it. So he kept on asking, among others, his professor friends at nearby Yale University. Perhaps he pestered them too long, or they recognized his native capacities. At any rate a professor of anthropology one day exploded with the suggestion: "You write it. You have some knowledge of the sciences involved; you have imagination; you have long experience in writing of varied sorts; you are excited about the wonders of modern biology. Why don't you tackle this evolution job? It will keep you busy for a while."

Mr. Ward was amused, then interested. It had possibilities. He asked a biologist friend. "Don't try," was the answer. "It can't be done." That settled it. He made up his mind to do it.

After two years he had a manuscript ready. He asked the professors for criticisms. They corrected some things, challenged others. They cleared it of technical errors. The result was *Evolution for John Doe*.

So now it has been told, this full and magic life-story of the world. Endorsed by scientists, prepared by years of study and research, Mr. Ward has written a volume of immeasurable value and interest and importance to Mr. John Doe.—*A. S. B.*

MY HERESY: *The Autobiography of An Idea*. By *William Montgomery Brown*. The John Day Company: $2.00.

INSTEAD of giving you a conventional review of this remarkable book by Bishop William Montgomery Brown, I'll merely say that it is the most sincere and human document that I have ever read, and quote a few sentences from one chapter headed "My Universe Disappears":

"I began to read *Origin of Species*." . . . It was a completely new kind of reading matter to me. It seemed to take nothing for granted. It did not lay down a principle to be proved. There was no apologetics here, no attempt to "justify the ways of God to man." Also there was no "inner light," and no profound conviction upon the part of the author that he had been ordained to extinguish other people's lights so that the whole world should thereafter use nothing but his.

"This Darwin was not seemingly concerned with making converts. He was just noticing things—living things—and watching how they acted. . . . If some one had noticed something that he had missed, or if his own notes were incorrect in any way, he would be awfully obliged if corrections were made.

"To me, who had been used to controversial literature, this was extraordinary reading, for something very strange had happened to me. I had become curious about life. . . .

"To learn about life by noting how it behaves, instead of laying down a law of behavior, surely had its fascinations. This was my first experience, and it filled me with terror, but I soon found that I could not stop. I finished *Origin of Species* more eager for knowledge than when I picked it up."

What happened to this orthodox Episcopalian Bishop who had become "curious about life" and "eager for knowledge" makes a tale more interesting than any novel. It is the kind of story that you will not only enjoy reading yourself, but you'll ask your friends to read it just as I am asking you to read it now. And the reading of it will mark the turning point in many a life. L. E. K.

AN OUTLINE OF MAN'S KNOWLEDGE. By Clement Wood. Published by Lewis Copeland Company, Inc. $5.00 Just received. Will be reviewed in our next.

SOME BOOKS WORTH READING

ONE of the objects of this journal is to bring to the attention of its readers books it believes will interest them. Each of the books on this list has its individual appeal, and will be sent postpaid on receipt of price.

In combination with a one year subscription for EVOLUTION at one dollar, you may deduct 50c on a $2.00 book order, or deduct $1.00 on an order of $5.00 or more.

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How many will follow this month the trail that they have blazed? All that send in four or more subscriptions will be acknowledged in this column. We'll measure our success not so much by the number of copies of EVOLUTION that we sell as by the number of readers who think well enough of this little journal to ask their friends to subscribe for it.

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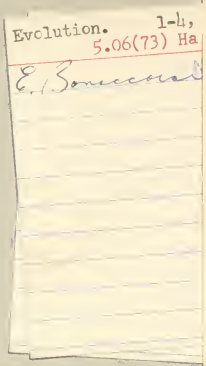

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